



Sambucus javanica Reinw. ex Blume

Viburnaceae

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Synonyms

Ebum javanicum (Reinw. ex Blume) Hosok.; *Phyteuma bipinnata* Lour.; *Phyteuma cochinchinensis* Lour.; *Sambucus argyi* H.Lév.; *Sambucus chinensis* var. *pinnatilobatus* G.W.Hu; *Sambucus ebuloides* Desv. ex DC.; *Sambucus henriana* Samutina; *Sambucus phyteumoides* DC.; *Sambucus thunbergiana* Blume ex Miq.; *Sambucus thunbergii* G.Don. (POWO 2020)

Local Names

Lao: Mos Hav (Hmongenese); **Indonesia:** sangitan (general), abur (Aceh), babalat (Bengkulu) bubukuan, kipapatong, kitespong (Sundanese), gegirang (Balinese), sengitan (Javanese); **Malaysia:** kerak nasi; **Thailand:** ta sigajeu (Karen), la oil toui (Lawa), choe-cha-bi (Nakian); **Philippines:** galamat, kalamata (Igorot), sauko (Tagalog); **Vietnam:** c[ow]m ch[asl]y, thu[oos]c m[o]I, s[os]c d[ij]ch, comchay; **English:** Javanese elder, Chinese elder (Junsongduang et al. 2013; Nam and Jae 2009; Partasasmita 2015; Ramdhan et al. 2015; Pongamornkul et al. 2020; Samuel et al. 2010; Sujarwo et al. 2020; van Valkenburg 2003; Whitney et al. 2014)

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Botany and Ecology

Description: A perennial herb or shrub with creeping rhizome, shrub or small tree up to 7 m tall. Stem grooved or smooth with beige bark that can peel off, it is woody and rough. Leaves are pinnate shaped with a serrulate margin and have the leaflets that occur in 2–6 pairs. Each pinnate is about 6–22 cm long and 6.5 cm wide. The leaflets are oblong to linear lanceolate. Topside of the leaves is light green with one midrib, while the bottom side is grayish and rough as opposed to the topside which is much smoother. Besides, the leaves can be oblique. Stipules glandular or foliaceous. Leaflet oblong, lanceolate or linear-lanceolate, 7–22(–30) cm × 1.5–6.5 cm, base cuneate to cordate, apex acuminate, shallowly serrate with lower teeth glandular swollen, shortly stalked to sessile. Small white flowers grow in a cymose corymb at the end of inflorescence. Inflorescence a terminal, flat-topped, 3–5(–7) rayed corymb up to 30 cm in diameter, with urceolate yellow, orange or scarlet nectaries in the outer axils. Flower bisexual, regular, 4–5 mm in diameter, 5 merous, lemon-scented. Calyx lobes minute, corolla rotate, with valvate lobes, white or creamy, stamens spreading, anthers yellow, white or creamy. Stamens spread, anthers yellow. Ovary inferior, 3 celled, stigma 3. Fruit a globose berry 3–4 mm in diameter, black or rarely scarlet to orange, 3 seeded. The berries are reddish purple and round shaped with a slight scent. Ripen berries are squeezable and the seeds are yellowish beige surrounded by a sticky exudate. Seeds ovoid, often ventrally flattened, verrucose. Seedling with epigeal germination (van Valkenburg 2003; Sujarwo et al. 2020).

Distribution and Habitat: *Sambucus javanica* native range is Bangladesh to West Central Malesia. Its geographic distribution is from India, Burma (Myanmar), Indochina, southern China, Taiwan, Japan, Thailand, throughout Malesia, except Peninsular Malaysia and Moluccas (POWO 2020). It is found growing in relatively moist primary and secondary forest along fringes and in clearings from sea level up to 2500 m altitude. In South-East Asia, it is most common above 1000 m asl (van Valkenburg 2003). **Phenology:** *Sambucus javanica* can be found flowering and fruiting throughout the year. Beetles are the main pollinator and may provide self as well as cross-pollination. Dispersal of the juicy berries is most likely effected by frugivorous bird. Germination of seed takes less than a month in full night (van Valkenburg 2003) (Figs. 1, 2, 3, and 4).

Local Medicinal Uses

Indonesia: The ethnic groups in Indonesia have been long used *S. javanica* as traditional medicine, especially the local communities in Java and Bali islands. van Valkenburg (2003) stated that in Indonesia, *S. javanica* leaves are considered as a laxative, whereas an infusion of flowers and leaves are used as a sudorific and diuretic. The local people in Bengkulu Province drink leaf and stem decoction to treat digestive disorders (Darwis 2012). The Sundanese in Cikondong village, West Java, use the stem and leaf decoction to treat wounds, bruises, and stiffness (Ramdhan et al. 2015). The juice of *S. javanica* leaves is applied to skin wounds

Fig. 1 Living plants of *Sambucus javanica* (VIBURNACEAE). Tarutung, North Sumatra, Indonesia. (© M. Silalahi)

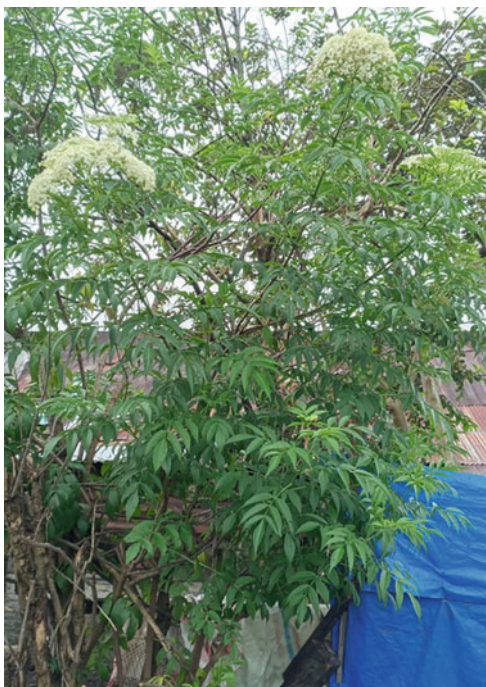


Fig. 2 Inflorescence of *Sambucus javanica* (VIBURNACEAE). Tarutung, North Sumatra, Indonesia. (© M. Silalahi)



Fig. 3 Immature fruits of *Sambucus javanica* (VIBURNACEAE). Tarutung, North Sumatra, Indonesia. (© M. Silalahi)



Fig. 4 Mature fruits of *Sambucus javanica* (VIBURNACEAE). Tarutung, North Sumatra, Indonesia. (© M. Silalahi)



and dermatitis by Balinese in Bali Island (Sujarwo et al. 2020). Local people in Central Sulawesi use fruit poultices to cure acne (Gailea et al. 2016). **Philippines:** The local communities in Mindanao consider the plant as a remedy for fatigue (van Valkenburg 2003). **Malaysia:** An infusion of dried leaves of *S. javanica* is considered antirheumatic and analgesic (van Valkenburg 2003); leaves crushed with water is applied on inflamed parts to reduce pain and inflammation (Samuel et al. 2010). **Thailand:** The Karen people in Chiang Mai use leaves to treat sprain and muscular pain (Tangjitman et al. 2015). The Karen in North Thailand use the leaves to cure wounds, diarrhea, rheumatoid arthritis, inflammation, and as muscle relaxant; the Lawa ethnic community uses it to treat bloating, bone fractures, and wound (Junsongduang et al. 2013, 2014). The local communities in Thailand crush the aerial parts and apply as poultice to inflammations (van Valkenburg 2003). In Nakian, Chiang Mai province, the plant is used as diuretic (roots), and to treat muscle pain, in postpartum healthcare (leaves), hemorrhoids, and burns (stems) (Pongamornkul et al. 2020). In Thailand, burnt leaves are also placed externally on the spot treat fractured bones and muscle pains (Kantasrila et al. 2020).

Phytochemistry

Aerial parts: The aerial parts of *S. javanica* contain 3 β ,23-dihydroxy-11 α ,12- α -epoxy-urs-20(30)-en-28,13 β -olide, ursolic acid, pomolic acid, oleanic acid, 2 α -hydroxy-oleanolic acid, α -amyrin, and lupeol palmitate (Chen et al. 2019). **Leaves:** Ethanol extract contains alkaloid, flavonoid, glycoside, anthraquinone glycoside, saponin, steroid/triterpenoid, and tannin (Dasopang 2017).

Bioactivities

S. javanica extracts are anti-inflammatory and antioxidant (Sujarwo et al. 2020; Putra and Rifai 2019a), immunomodulatory (Putra and Rifai 2019a), promotes hematopoiesis (Putra and Rifai 2019b), and antibacterial (Dasopang 2017). Ethanol extract of leaves inhibits the growth of *Escherichia coli* and *Salmonella typhi* at a concentration of 500 mg/ml with inhibition zones of 16.11 and 17.04 mm, respectively (Dasopang 2017). Experimental mice orally administrated with 2.8 mg.kg⁻¹ BW of 7,12-dimetilbenz(α)anthracene (DMBA) for ten times a month, and administered with fruit and leaf extract showed a significant decrease of expression of tumor necrosis factor alpha (TNF- α) and interferon gamma (IFN- γ) (Putra and Rifai 2019a); the fruit and leaf extracts have therapeutic potential against the unfavorable effects of DMBA as they modulate the T-cells regulation (Putra et al. 2020). The fruit and leaf extracts show hematopoiesis in a chloramphenicol-induced aplastic anemia mouse model (Putra and Rifai 2019b). The compounds 3 β ,23-dihydroxy-11 α ,12- α -epoxy-urs-20(30)-en-28,13 β -olide and pomolic acid from aerial parts exhibited inhibitory effect against nitric oxide (NO) production in lipopolysaccharide (LPS)-activated RAW264.7 macrophage cell lines (Chen et al. 2019).

Economic Importance

Indonesia: The leaves, stems, flowers, and leaf powder have been widely sold in the marketplaces to treat various diseases such as swelling and bruising, broken bones, rheumatism, aches and pains, jaundice, beriberi, dysentery, and chronic inflammation of the airways. A drink powder is made from the fruits which is marketed as an immunity booster (Aryanto 2020; Rintani 2020).

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